

REMARKS

The Office Action dated February 5, 2007, has been received and carefully noted. The above amendments and the following remarks are being submitted as a full and complete response thereto. Claims 1-6 are pending in this application. By this Amendment, claims 1-2 and 5-6 are amended. Support for the amendment to claims 1 and 5 can be found in the drawings at, for example, Figs. 3, 4C and 5B. No new matter has been added. Reconsideration of the application is respectfully requested.

Entry of this Amendment is proper under 37 C.F.R. §1.116 since the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issues requiring further search and/or consideration on the part of the Examiner as the Amendment merely clarifies the claimed features of the invention; (c) satisfy a requirement of form asserted in the previous Office Action; (d) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (e) place the application in better form for appeal, should an appeal be necessary. The Amendment is necessary and was not earlier presented because it is made in response to objections raised in the Final Rejection. Entry of the Amendment is thus respectfully requested.

The Office Action rejects claims 1-3 and 5-6 under 35 U.S.C. § 103(a) over Gopalraja et al. (U.S. Patent No. 6,193,855) in view of Shimamura et al. (U.S. Patent No. 4,963,239); and claim 4 under 35 U.S.C. § 103(a) over Gopalraja and Shimamura in view of Yamamoto (U.S. Patent Application Publication No. 2002/0173144). The rejections are respectfully traversed.

The above-identified application claims a bias sputtering film forming process, and associated apparatus, for forming a thin film by applying voltages of a cathode voltage and a substrate bias voltage, wherein sputtering film forming is performed while progressively varying the substrate bias voltage, and wherein the substrate bias voltage corresponds to a stored substrate bias voltage value in a database stored in a control system, as recited in independent claim 1, and similarly recited in independent claim 5.

The Office Action admits that Gopalraja fails to disclose or suggest that the substrate bias voltage corresponds to a stored value in a database stored in a control system (Office Action, page 4, lines 18-20). The Office Action relies on Shimamura to cure deficiencies in Gopalraja in disclosing or rendering obvious this feature. However, the Office Action is mistaken for the following reason.

Shimamura teaches a sputtering process of a substrate biasing system and an apparatus for carrying out the same that is capable of forming a film in satisfactory surface coverage over stepped underlying layer (Abstract). Shimamura also teaches that the computer 107 stores waveforms of the substrate bias voltage, substrate bias voltages, duty factors and frequencies of the waveform of the output voltage of the power supply 120 in a plurality of data files used selectively during a film forming process (column 10, lines 40-47). Shimamura further teaches that the output power of the radio frequency power supply 120 is varied in a wave form of a continuously and periodically variable amplitude (Col. 12, lines 54-58; Fig. 9(a)). Thus, Shimamura clearly teaches that the output power must be periodic. As such, if the output power is periodic, as clearly shown in Fig. 9(a), the output power cannot be progressive, as

illustrated in the drawings of the present application at, for example, Figs. 3, 4C and 5B, which clearly show that the output power evolves in one direction only, and does not alternatively increase and decrease. Accordingly, Shimamura cannot have a progressive variation of the substrate bias voltage, as recited in independent claims 1 and 5. Thus, a combination of Shimamura and Gopalraja fails to arrive at the subject matter of independent claims 1 and 5. Thus, independent claims 1 and 5, and their dependent claims, are patentable over a combination of Gopalraja and Shimamura.

Yamamoto teaches a method of manufacturing a semiconductor device that forms an agglomeration-free seed layer on the inner surface of a recessed portion so as to restrain voids in a metal filled by the plating method (Abstract). However, Yamamoto fails to cure deficiencies in Shimamura and Gopalraja in disclosing or rendering obvious the features of claim 4, including the features of independent claim 1.

For at least these reasons, independent claims 1 and 5, and their dependent claims, are patentable over a combination of the applied references. Thus, withdrawal of the rejections of the claims under 35 U.S.C. §103(a) is respectfully requested.

Should the Examiner determine that any further action is necessary to place this application into better form, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing Attorney Dkt. No. 029567-00004.**

Respectfully submitted,



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